

68-77

EXPLANATION

ALLUVIAL FACIES

COLLUVIAL FACIES

CLIFF FACIES

Q<sub>1</sub> TIME OF DEVELOPMENT OF LATE RECENT SOIL

Q<sub>1</sub>

Earthflow and solifluction deposits  
Unsorted boulder, cobble, and pebble gravel in a light-greenish-gray sandy silt matrix; contains some basalt boulders derived from land slide deposits; predominantly angular fragments of sandstone, siltstone, and claystone derived from the Wasatch Formation. Surfaces are irregular, often crudely terraced with lobes and swales and undrained depressions; local pond deposits. Almost exclusively restricted to areas underlain by the claystone-rich members of the Wasatch Formation. 1-30 feet thick

TIME OF DEVELOPMENT OF POST-GRAND MESA SOIL

Q<sub>1a</sub>  
Q<sub>1b</sub>  
Q<sub>1c</sub>

Q<sub>2</sub>  
Q<sub>2a</sub>  
Q<sub>2b</sub>

Q<sub>3</sub>

Mudflows and fan gravel of Grand Mesa  
Pebble, cobble, and boulder gravel in a gray matrix of coarse sand; poorly sorted with stones seldom in contact; stones angular to subangular; primarily unweathered basalt. Derived largely from solifluction deposits (Q<sub>1</sub>). Forms both smooth and irregular slopes, some natural levees. Several generations of flows cut out and override terrace and fan gravels of Lands End (Q<sub>1a</sub>) and older mudflow deposits

Pediment gravel of Grand Mesa  
Pebble, cobble, and boulder gravel in a light-greenish-gray silty sand matrix; poorly sorted; commonly unstratified; stones angular to subangular, slabs predominantly locally derived sandstone, siltstone, claystone, and marlstone; basalt boulders scarce. Deposits especially common at the base of steep slopes in the arid regions. Probably includes some colluvial material. Gradients 150-200 feet per mile. Commonly mantled with thin reddish-brown eolian silt. 5-40 feet thick  
Q<sub>2</sub>, pediment gravel undifferentiated; 100-200 feet above streams  
Q<sub>2a</sub>, older pediment gravel; 300 feet above streams

TIME OF DEVELOPMENT OF LANDS END-GRAND MESA INTERGLACIAL SOIL

Q<sub>1a</sub>

Terrace and fan gravels of Lands End  
Grayish-brown sandy gravel; moderately to poorly sorted; poorly stratified, rock fragments angular to well rounded; basalt and locally derived slabby siltstone, marlstone, and sandstone. North of Battlement Mesa the fan gravels are deposited on pre-Wisconsin pediments and alluvial fans. Gradients of fans 400 feet per mile; 20-200 feet thick

Q<sub>1a</sub>  
Q<sub>1b</sub>

Terrace and fan gravels  
Pebble, cobble, and boulder gravel; stones subrounded to well rounded; sorting poor to good; stones equally divided between basalt and locally derived sandstone, claystone, siltstone, and marlstone; matrix is greenish-gray silty sand. Reddish-brown windblown sand and silt locally mantles terrace surfaces. Gradients vary between 150 and 400 feet per mile; generally less than 60 feet thick  
Q<sub>1a</sub>, older terrace and fan gravel

Q<sub>2</sub>

Pediment gravel  
Subangular to subrounded pebble, cobble, and boulder gravel; basalt boulders as much as 8 feet in diameter; cobbles, pebbles, and matrix are approximately 50 percent locally derived grayish-green sandstone, siltstone, and claystone; poorly sorted except near Colorado River. Gravel surface is commonly mantled with a thin veneer of reddish-brown windblown sand and silt. Gradients commonly 300-400 feet per mile; 400-600 feet above Colorado River. Generally less than 50 feet thick

CLIFF FACIES

ALLUVIAL FACIES

COLLUVIAL FACIES

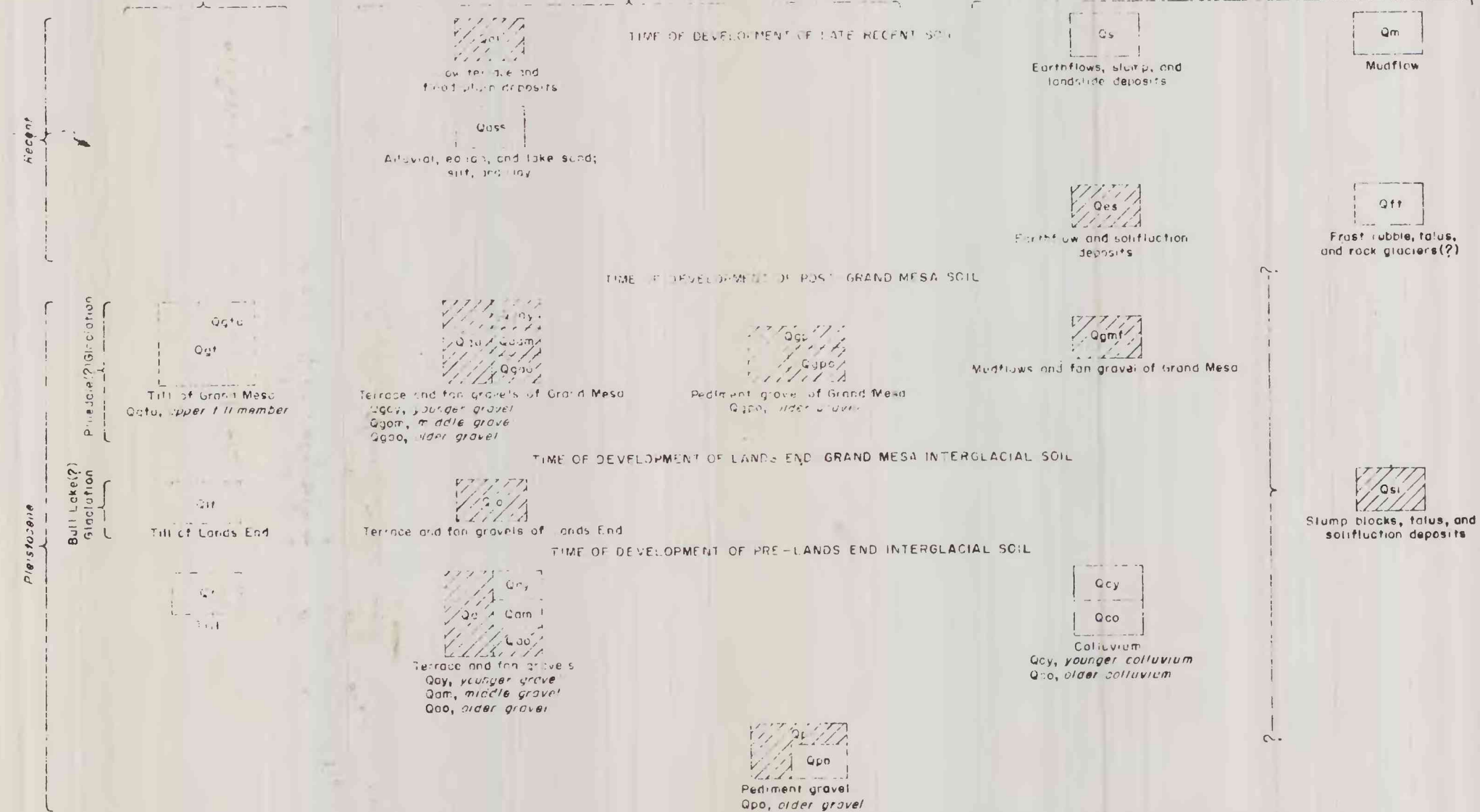


DIAGRAM SHOWING RELATIVE AGES OF SURFICIAL UNITS IN THE GRAND MESA-BATTELEMENT MESA AREA  
Patterned boxes indicate units present in this quadrangle

Green River Formation

Tge, Evacuation Creek Member: light-brown and gray very fine to medium grained sandstone and light-gray marlstone and siltstone  
Tgr, Parachute Creek Member: black, brown, and gray oil shale of varying quality that locally forms cliffs; contains minor amount of light-gray siltstone and light-gray and brown fine- to medium-grained sandstone; numerous thin, persistent analcite and tuff beds. Outcrop of richest oil shale bed (Mahogany bed) indicated by dashed-and-dotted line  
Tgg, Garden Gulch Member: light-gray barren marlstone, dark-brown to black paper shale (oil shale of varying quality), light-gray siltstone and sandstone, light-gray algal limestone, and some massive brown fine- to medium-grained sandstone  
Tgd, Poupas Creek Member: brown and buff ledge-forming massive fine- to coarse-grained sandstone and gray shale; a few papery oil-shale beds  
Tgl, lower member: fine- to coarse-grained gray and brown sandstone containing minor amounts of light-gray siltstone and marlstone and a few thin low-grade oil-shale beds

Upper member of Wasatch Formation

Variegated red, gray, purple, and lavender shale and clay, red predominant; some lenticular fine- to coarse-grained channel sandstone

Contact

Dashed where approximately located

Gas well

\*Although these strata are here assigned to the Evacuation Creek Member of the Green River Formation, as they commonly have been here and elsewhere in the Piceance Creek Basin, they are lithologically more similar to and probably equivalent to the Uinta Formation as used in the Uinta Basin (see H. D. Curry, 1964, Oil-content correlation of Green River oil shales, Uinta and Piceance Creek Basins: Intermountain Assoc. Petroleum Geologists Guidebook, 13th Ann. Field Conf., p. 169-171).

This report is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey standards

SOIL DESCRIPTIONS

Only those soils displaying a completely developed diagnostic profile are described. These soils may occupy as little as 10 percent of the mapped area of a unit.

LATE RECENT SOIL:

A horizon: reddish-gray to brownish-black silt, brownish-black fine sandy silt loam, and black silty clay; humic; 0.5-1.5 ft.  
Cca horizon (generally absent): contains fracture fillings and thin stringers of grayish-white calcium carbonate; some thin carbonate films on stones; 0.4-0.6 ft.

POST-GRAND MESA SOIL:

A horizon: brown and dark-brown to dark-reddish-gray gravelly silt loam to brownish-black silt; friable; 0.5-1.8 ft.  
B horizon: moderate-yellowish-brown (10YR 4/4) gravelly silt loam to reddish-brown (5YR 4/3) sandy silt loam to dark-reddish-gray gravelly silt loam; loose, weak granular structure; very weakly oxidized; pH 8.0; 0.8-1.7 ft.  
Cca horizon: white to gray-white gravelly silt; calcium-carbonate impregnation ranges from very strong with well-developed platy structure to thin coatings on stones; 1.0-1.5 ft.

LANDS END-GRAND MESA INTERGLACIAL SOIL:

A horizon: brown to brownish-black silt and fine silty sand; loose, friable; 0.5-1.5 ft.  
B horizon: dark-reddish-brown (5YR 2/3) clay to dark-reddish-brown (5YR 4/4) sandy silt to reddish-brown (2.5YR 4/4) silty clay loam and silt; clay skins, medium platy to blocky structure; moderately sticky; pH 8.5; secondary carbonate; 1.5-3.0 ft.  
Cca horizon: pink (7.5YR 7/4) silt loam to white gravelly silt; strongly impregnated with calcium carbonate; locally indurated platy structure; 1.5-5.0 ft.

PRE-LANDS END INTERGLACIAL SOIL:

A horizon: dark-brown to brown sandy silt; friable, calcium-carbonate aggregates scattered throughout; probably of modern origin; no structure; pH 8.0; 0.5-1.5 ft.  
B horizon (commonly partially or completely stripped): reddish-brown (5YR 5/3-5YR 4/3) fine sandy silt, a few partially weathered basalt pebbles; weak blocky structure, very slightly sticky; 2.0-3.0 ft.  
Cca horizon: white gravelly silty sand; very strongly impregnated with calcium carbonate, stones often thickly coated; prominent platy structure, moderately well cemented, firm; 3.0-5.0 ft.